

BACKFLOW PREVENTION RE-CERTIFICATION STATIONS

Below is a listing of the current re-certification stations for backflow prevention assembly testers in South Carolina. You must contact one of the recertification stations to schedule your recertification exam. The proctor will provide you with dates, costs, and locations of the next scheduled exam. The study guide material is attached for your review. Read the two pages as it will cover some of the questions you will see on the written exam.

Mr. David Zorn
Zorn Consulting, LLC
Orangeburg Area
(803) 536-6387 or (803) 707-8153

Mr. Matt McCoy/Mr. Charles Clinemyer
Greenwood C.P.W.
Greenwood Area
(864) 942-8196

Mr. Harry Peart
Rock Hill Area
(803) 324-0927
(803) 417-1014

Mr. J.T. Johnson
Johnson Backflow Prevention
Cheraw Area
(843) 537-4230

Mr. Don Sondles
Charleston Water System
Charleston Area
(843) 727-6980

Mr. Malcolm Cook
City of Florence RR
Florence Area
(843) 665-3236

Mr. Robert Bird
Seneca Light & Water
Oconee, Pickens, & Anderson Area
(864) 885-1625 or (864) 916-1501

Mr. Brent Thomas
Grand Strand Water & Sewer
Myrtle Beach / Conway Area
(843) 443-8214 or (843) 333-8955

Mr. Roderick Herring
City of Columbia
Columbia Area
(803) 545-3876

Mr. Kenneth Davis
Spartanburg Area, Clinics held at
Inman Campobello Water
(864) 208-6334 or (864) 578-6365

If you have any questions, please contact Mr. Steve Fox, SCDHEC, Bureau of Water,
at (803) 898-4426 phone or (803) 898-3795 fax, or e-mail foxsc@dhec.sc.gov

STUDY GUIDE FOR RECERTIFICATION TEST

A **CROSS CONNECTION** is defined as, “any actual or potential connection or structural arrangement between a public water system and any other source or system through which it is possible to introduce into any part of the potable system any used water, industrial fluid, gas or substance other than the intended potable water with which the system is supplied. Bypass arrangements, jumper connections, removable sections, swivel or changeover devices, and other temporary or permanent devices through which or because of which backflow can or may occur are considered to be cross-connections”. A cross connection can never be allowed. You either must remove the cross connection from the plumbing system or it must be properly protected against backflow.

Backflow is the reversal of the normal direction of flow of liquid or gas. The two types or forms of backflow are backsiphonage and backpressure. Backsiphonage occurs when the water distribution system drops below atmospheric pressure which is 14.7 psi at sea level. Backsiphonage may occur when there is a loss of pressure on the water distribution system like when a large water main breaks. Backpressure occurs when internal plumbing pressure exceeds the supply pressure. A water heater in your home may cause backpressure to the public water system.

When testing a Double Check Valve Assembly with the vertical tube the critical level of the tube must be located at the outlet level of the downstream test cock that is open. The vertical tube test creates one PSI of pressure on the supply side of each check valve by filling the vertical tube to a level of 27 and $\frac{3}{4}$ ” or 28” inches. Any time you use the vertical tube or a differential gauge and one hose the test method is called **direction of flow**. The DCVA is designed for a non-health hazard/low hazard category cross connection under backsiphonage or backpressure. The maximum pressure loss acceptable through an approved DCVA is 10 psi. Both check valves in a DCVA must hold **1.0 psi** or greater. When testing a DCVA with a differential gauge and you use two hoses, the high hose and low hose the test method is called **differential pressure**. The only shut-off valve you will close on the DCVA when performing the differential pressure test is the #2. The #1 shut-off valve must remain open to perform this differential pressure test.

The Pressure Vacuum Breaker must be installed 12" above any downstream plumbing or sprinkler head. The PVB is designed for a health/high hazard category cross connection under backsiphonage only meaning it is not approved or designed for backpressure. The PVB works under continuous pressure meaning you can install a shut-off valve downstream of a PVB. In a PVB the air inlet valve must open at 1.0psi or greater and the check valve must close at 1.0psi or greater. Finally, the PVB, RP, & DCVA are required to be tested annually whereas the Atmospheric Vacuum Breaker (AVB) can't be tested. The AVB must be installed 6" above any

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downstream plumbing or sprinkler head. The PVB must be tested with a differential gauge with one hose, we call this a direction of flow test. When testing the PVB and you connect the high hose to test cock #2, you are testing the air inlet valve. However, when testing the PVB and you connect the high hose to test cock #1, you are testing the check valve. The hose bibb vacuum breaker is the third vacuum breaker in the family. The PVB, AVB, and hose bibb vacuum breaker are all approved for backsiphonage only, no backpressure.

When testing a Reduced Pressure Principle Assembly, the pressure differential relief valve must operate to maintain the zone between the two check valves at least **2.0 psid** less than supply pressure. Also, the second check valve on a RP must be **1.0 psid or greater**. When testing the first check valve on a RP, the acceptable value is **5.0 psid or greater**. If the RP is discharging water under a **flowing and non-flowing** condition the most obvious problem is a fouled differential pressure relief valve. However, if the RP is discharging water under a **non-flowing** condition only the most obvious problem is a failed first check valve. When testing the RP the only shut-off valve you close to perform the test is the #2. The #1 shut-off must always remain open. Water pressure is designed to keep the relief valve closed in a RP. So, the spring in the relief valve is designed to always open in an effort to discharge water out of the vent.

The State Primary Drinking Water Regulations require that fire line sprinkler systems in South Carolina must be protected with the minimum of an approved Double Check Valve Assembly. The Reduced Pressure Backflow Prevention Assembly is required when antifreeze, foaming agents, or an auxiliary water supply is tied into the fire line sprinkler system. Double Detector Check Valve Assemblies are sometimes required on fire sprinkler systems by public water systems in SC to detect leaks and/or someone stealing water.

In SC there are only two approved methods of testing a Reduced Pressure Principle Assembly (RP), Double Check Valve Assembly (DCVA), or Pressure Vacuum Breaker (PVB). The **direction of flow test** with the vertical tube or differential gauge using one hose or **differential pressure test** using a differential gauge and two hoses.

** This study sheet is not designed to cover every question which is found on the recertification test. There are a number of questions pertaining to trouble shooting and testing the RP, PVB, and DCVA, as well as some general knowledge questions which you, as a tester are expected to already know. If you have been properly testing assemblies in the past you will not have any problems with those questions. If you have not been properly testing, diagnosing, and repairing assemblies then the place to be retrained for that is in the three-day seminar. The purpose of the recertification testing is not to teach the course over again, but to allow qualified testers to prove their qualifications. **